

LENGTH OF PRG 00512

	1		IDENT	TPHNDLR	
	2		MACRO	LAB,, FUNCT	
	3		NAME	ISSUE	
	4	\$LAB	ENA	\$FUNCT	
	5		RTJ	SEL	
	6		END		
00150 P	7		ENTRY	MTCON	
00020 P	8		ENTRY	TPINT, TPINIT	
00115 P	9		ENTRY	TBKSP	
00106 P	10		ENTRY	TFWSP	
00053 P	11		ENTRY	TREAD	
00112 P	12		ENTRY	TREWIND	
00102 P	13		ENTRY	TSBPFM	
00100 P	14		ENTRY	TSFPFM	
00445 P	15		ENTRY	TSTATUS	
00056 P	16		ENTRY	TWRITE	
00064 P	17		ENTRY	TWFM	
00000 P	18		ENTRY	TXSTART	
	19		EXT	BIT17	
	20		EXT	BIT18	
	21		EXT	BIT20	
	22		EXT	BIT21	
	23		EXT	BIT22	
	24		EXT	BIT23	
	25		EXT	D10	
	25+001		EXT	IOCL	
	25+002		EXT	IOCLBIT	
	25+003		EXT	FLAGS	
	25+004		EXT	CONNECT	ROUTINE TO CONNECT TO CONTROLLERS
	26+001		EXT	OCTPACK	ROUTINE TO PACK OCTAL INTO BCD
	26+002		EXT	TIMEKILL	
	26+003		EXT	TIMSET	
	26+004		EXT	TNUMLIST	
	27		EXT	TXMP	MEMORY PARITY ERROR ON WRITE
	28		EXT	TXNE	NORMAL END RETURN
	29		EXT	TXNR	NOT READY RETURN
	30		EXT	TXPV	PROTECT VIOLATION RETURN
	31		EXT	UNCON	ROUTINE TO RELEASE CHANNEL
	31+001	X0	EQU	OPMSGX	
00000	31+002	X1	EQU	0	
00001	32	X2	EQU	1	
00002	33	X3	EQU	2	
00003	34		EQU	3	
00001	34+001	ALCNT	EQU	1*2 <sup>10</sup>	INITIAL ERROR COUNTER (SSH WORD)
00022	35	CLOCK	EQU	22B	
	36	EODB	EQU	BIT21	
	37	FMRBIT	EQU	BIT20	END OF DATA BIT IS 21 FILE MARK READ BIT IS 20
00000	38	IMPURE	EQU	0	
07774	39+001	EINT	EQU	7774B	
07773	39+002	DINT	EQU	7773B	
00000	40	IO	EQU	0	
	41	LP8	EQU	BIT22	LOAD POINT BIT IS 22
00000	42	SELECT	EQU	0	
00000	43	SENSE	EQU	0	
11610	44	TIMELIM	EQU	5000	ALLOW FIVE SECONDS ON A CHANNEL
00000	45	TXSTART	BSS	1	CLOCK AT START OF TAPE I/O
00001 00000000	46	STATAB	00	IMPURE	WORD FOR UNIT STATUS
	47	*			RIGHT 3 BITS ARE DENSITY CODE
	48	*			0 - 200 BPI
	49	*			1 - 556 BPI
	50	*			2 - 800 BPI
	51	*			3 - UNSPECIFIED
	52	*			
	53	*			
00010	54	RRBIT	EQU	108	BIT 3 SEZ REVERSE READ SET
00400	55	READBIT	EQU	400B	BIT 8 SEZ READING
01000	56	WRITBIT	EQU	1000B	BIT 9 SEZ WRITING
02000	57	REREADBIT	EQU	2000B	BIT 10 SEZ BACKSPACING FOR REREAD
04000	58	EWRITBIT	EQU	4000B	BIT 11 SEZ BACKSPACING FOR REWRT
20000	59	SBINBIT	EQU	20000B	BIT 13 SEZ LAST OPERATION IN BINA
00002 00000000	60	BINLEN	00	IMPURE	
00003 00000001	61	ERK	00	ALCNT+IMPURE	PARTY ERROR COUNTER
00004 00000000	62	TPB GNA	00	IMPURE	STARTING ADDRESS SAVED HERE
00005 77000000	63	TPI	77	IMPURE	TEMP FOR SAVING UNIT INDEX
00006 00000000	64	TPRLNG	00	IMPURE	RECORD LENGTH STORED HERE
00007 00000000	65	CHBUF	00	IMPURE	
00010 04030640	66				
00011 45456044	67	DENTAB	OCT	04030640	SELECT DENSITY FUNCTION CODES
	67+001	MTERR	BCD	7,NN MT=X F S=SSSS TN=TAPENUMA	
00052 P	67+002	MTUNIT	EQU,C	MTERR+6	
00054 P	67+003	MTFUN	EQU,C	MTERR+8	

00014 P	67+004	MTSTATP	EQU	MTERR+3
00070 P	67+005	TNUMP	EQU,C	MTERR+20
00034	67+006	MTERRL	EQU,C	*-MTERR

LENGTH OF MESSAGE IN CHARACTERS

00020	47300145 P	92	TPINIT	STI	RETURN,X3	SAVE THE RETURN ADDRESS
00021	47200052 P	93	STI	FUNCTION,X2	SAVE FUNCTION	
00022	40000002 P	94	STA	BINDEN	SAVE BINARY AND DENSITY INDICATOR	
00023	12077765	95	SHA	-10	SET BINARY BIT INTO STAB	
00024	17620000	96	ANA	SBINBIT		
00025	40000001 P	97	STA	STATAB	THIS IS FIRST BIT TO GET SET	
00026	14400000	98	ENA,S	0		
00027	13000006	99	SHAQ	6	GET UNIT NUMBER TO A	
00030	40000005 P	100	STA	TPI	SAVE UNIT NUMBER	
00031	13000003	101	SHAQ	3	WHICH PAGE FILE SECTION TO A	
00032	44000141 P	102	SWA	PFPA	SAVE FCR INPUT/OUTPUT COMMANDS	
00033	14400000	103	ENA,S	0	PREVENT TROUBLE ON AIA	
00034	40000006 P	104	STA	TPRLNG	FOR STATUS REQUEST	
00035	13000017	105	SHAQ	15	STARTING ADDRESS TO A	
00036	44000143 P	106	SWA	TPOPC1		
00037	40000004 P	107	STA	TPBGN	SAVE BEGINNING ADDRESS	
00040	53140000	108	AIA	X1	ADD WORD COUNT	
00041	44000142 P	109	SWA	TPOPM1	STORE END ADDRESS	
00042	00700146 P	110	RTJ	TPCON	CONNECT TO UNIT	
00043	04000001	110+001	TWW01	ISE	IMPURE+1,X0	
00044	77200002	111	EXS	2,SENSE		CHECK FOR BUSY
00045	01000122 P	112	UJP	TPBUSY		
	00046 P	113	TWW0	EQU	*	
00046	53020022	114	TMA	CLOCK		
00047	40000000 P	115	STA	TXSTART	SAVE THE STARTING CLOCK VALUE	
00050	47000373 P	116	STI	TPDELY,0	RESET FLAG	
00051	00700243 P	117	RTJ	TPSLN	SELECT INTERRUPTS AND MODE	
00052	01000000	118	FUNCTION UJP	IMPURE	CALL APPROPRIATE ROUTINE	

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 118+003 \*\*  
 118+004 \*\* THESE ROUTINES ARE TO PERFORM THE VARIOUS ALLOWED FUNCTIONS \*  
 118+005 \*\* \*\*\*  
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00053	00053 P 14700074	123	TREAD	EQU	*	
00054	14600400	124	ENQ	748	ENTER CODE FOR READ	
00055	01000136 P	125	ENA	READBIT	ENTER BIT FOR READ	
		126	UJP	TPIO	GO GIVE INPUT	
	00056 P 14700076	126+001	TWRITE	EQU	*	
00057	14601000	127	ENQ	768	ENTER CODE FOR WRITE	
00060	77200004	128	ENA	WRITBIT		
00061	01000136 P 00062 P	129	EXS	4,SENSE	CHECK FOR WRITE ENABLE	
00062	14277777 X	130	UJP	TPIO		
00063	01000165 P	131	EQU	*		
		132	TPVL	ENI	TXPV,X2	GIVE PROTECT VIOLATION
		133	UJP	TGRID	GET RID OF UNIT	
	00064 P 77200004	134	EQU	*		
00065	01000067 P	134+001	TWFN	EXS	4,SENSE	CHECK FOR WRITE ENABLE
00066	01000062 P	135	UJP	*+2	OKAY	
00067	14600015	136	EQU	TPVL	NAUGHTY	
		137	ENA	153		
	00070 P 00700130 P	138+002	TPNFR	EQU	*	
00070		140	RTJ	SEL	COME HERE FOR BAD FUNCTIONS	
	00071 P 14200073 P	140+001	TPNFR0	EQU	*	
00071		140+002	ENI	*+2,X2	SPECIFY RETURN ADDRESS	
00072	01000505 P	140+003	UJP	TPTIMUP1		
		140+004	EQU	*		
00073	00073 P 47000043 P	140+005	TPNFR1	STI	TWWD1,X0	DON'T LET ANYONE ELSE THRU.
		140+006				
		140+007				
00074	00074 P 14600020	140+008	TPNFR2	EQU	*	
00076	54200145 P	140+009	ISSUE	(208)		
00077	01077777 X	143	LDI	RETURN,X2	LOAD THE RETURN ADDRESS	
		144	UJP	UNCON	RELEASE CHANNEL	
	00100 P 14600013	144+001	TSFPFM	EQU	*	
00100		145	ENA	138	SELECT SEARCH END OF FILE FORWARD	
00101	01000070 P	146	UJP	TPNFR		
		146+002	EQU	*		
	00102 P 77200020	147	TSBPFM	EQU	*	
00102		148	EXS	208,SENSE	CHECK FOR LOAD POINT	
00103	01000406 P	149	UJP	TPRELS		
00104	14600014	150	ENA	143	SELECT SEARCH END OF FILE BACKWAR	
00105	01000120 P	151	UJP	FINISH		
		152	EQU	*		
	00106 P 14600041	152+001	TFWSP	EQU	*	
00106		153	ISSUE	(418)	SELECT REVERSE READ	
00110	14600012	154	ENA	128	SELECT BACKSPACE	
00111	01000070 P	155	UJP	TPNFR		
		155+001	EQU	*		
	00112 P 14600010	155+002	TPREWIND	EQU	*	
00112		156	ISSUE	(10B)	SELECT REWIND	
00114	01000445 P	157	UJP	TSTATUS	RETURN AND GIVE STATUS	
		157+002	EQU	*		
	00115 P 77200020	157+003	TBKSP	EQU	*	
00115		158	EXS	208,SENSE	CHECK FOR LOAD POINT	
00116	01000445 P	159	UJP	TSTATUS		
		160	EQU	*		
	00117 P 14600012	161	ENQ	208,SENSE		
00117		161+001	RTJ	SEL	SELECT BACKSPACE	
		161+002	UJP	TPNFR1		
	00120 P 00120 P	162	EQU	*	ISSUE FUNCTION	
00120	00700130 P	163	FINISH	ENI		
00121	01000073 P	164	UJP	128		
		165	EQU	*		
	00122 P 47200373 P	165+001	TPBUSY	RTJ		
00122		166	STI	SEL		
		167	UJP	TPDLY,X2	SAY WE WERE DELAYED	
00123	01000074 P	167+002	EQU	TPNFR2		

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 167+005 \*\*  
 167+006 \*\* ROUTINE TO PROCESS SELECT FUNCTION ON THE CONNECTED DRIVE  
 167+007 \*\* ENTER WITH THE SELECT FUNCTION IN THE LOWER 6 BITS OF A  
 167+008 \*\*  
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00124	53010022	175	REJ	TMQ	CLOCK	LOAD THE VALUE OF THE CLOCK AND
00125	03500133 P	176	ISUF	AQJ, NE	NEWCLK	SEE IF IT'S COUNTED UP YET
00126	77100000	177	SEL	SEL	IMPURE, SELECT	ISSUE THE I/O FUNCTION
00127	01000124 P	178	UJP	REJ		BAD NEWS, REJECTED
00130	01000000	179	SEL	UJP	IMPURE	TO ISSUE SELECT COMMANDS
00131	44000126 P	180	SWA	ISUF		SAVE FUNCTION CODE
00132	14100005	181	ENI	5,X1		ENTER COUNT OF MILLISECONDS
00133	53020022	182	NEWCLK	TMA	CLOCK	LOAD REFERENCE CLOCK VALUE
00134	02500126 P	183	IJD	ISUF, X1		JUMP IF STILL LIFE LEFT
00135	01000164 P	184	UJP	UNERR		SO SORRY CHARLIE

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 188  
 189 \*\*  
 190 \*\*  
 191 \*\* ROUTINE TO ISSUE THE I/O COMMAND TO THE TAPE UNIT  
 192 \*\* ENTER WITH  
 193 \*\* STATUS BITS IN A REG.  
 194 \*\* OP-CODE IN LOWER CHARACTER POSITION OF Q REG  
 195 \*\* CHANNEL NUMBER IN CHANNEL INDEX  
 196 \*\*  
 197 \*\*  
 198 \*\*\*\*\*

00136	00136 P	201	TPIO	EQU	*	
00136	35000001 P	202		SSA	STATAB	SET A INTO STATUS
00137	40000001 P	203		STA	STATAB	STORE STATUS BACK
00140	43000610 P	00142 0	204	SQCH	TPOPM1	STORE OP-CODE
00141	14600000	206	PFPA	ENA	IMPURE	WHICH PAGE FILE PORTION
00142	74000000	207	TPOPM1	74	IMPURE, IO	I/O COMMAND WORD
00143	00400000	208	TPOPC1	00	IMPURE, 4	SUB INSTRUCTION WORD
00144	01000142 P	209		UJP	TPOPM1	REJECT
00145	01000000	210	RETURN	UJP	IMPURE	RETURN

00146	01000000	223	TPCON	UJP	IMPURE	
00147	54100005 P	224		LDI	TPI,X1	LOAD UNIT NUMBER
00150	16100000	225	MTCON	XOI	IMPURE,X1	MAKE INTO CONNECT CODE
00151	54200145 P	226		LDI	RETURN,X2	LOAD THE RETURN ADDRESS
00152	14711610	227		ENQ	TIMELIMIT	ENTER LIMIT ON CHANNEL TIME
00153	14300153 P	228		ENI	*,X3	
00154	01077777 X	229		UJP	CONNECT	CALL ROUTINE TO CONNECT TO UNIT
00155	00700225 P	230		RTJ	CHANINT	CALL HERE ON CHANNEL INTERRUPT
00156	01200000	231		UJP	0,X2	CHANNEL BUSY RETURN
00157	47200145 P	232		STI	RETURN,X2	SAVE THE RETURN ADDRESS
00160	20000005 P	233		LOA	TPI	CHECK FOR INTERRUPT NOT EXPECTED
00161	03300165 P	234	AZJ,LT		TGRID	TRY TO GET RID OF IT
00162	77200001	235	EXS	I,SENSE		CHECK FOR READY
00163	01000146 P	236		UJP	TPCON	

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***** THIS ROUTINE WILL RELEASE AND DISCONNECT THE SELECTED DRIVE  
236+003 **  
236+004 **  
236+005 ** CLEARING ALL INTERRUPT SELECTS AND STATUS BEFORE EXIT  
236+006 **  
236+007 ** CALLING SEQUENCE --  
236+008 **  
236+009 ** ENT <RETURN ADDRESS>, X2  
236+010 ** UJP TGIRD RELEASE AND CLEAR DEVICE  
236+011 **  
236+012 ** -- OR --  
236+013 **  
236+014 ** UJP UNERR UNIT NOT READY  
236+015 ** (RETURNS TO TXNR IN UIO)  
236+016 **
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00164	14277777 X	239	UNERR	EQU	*	
	00165 P	240		ENI	TXNR,X2	NOT READY RETURN
		241	TGRID	EQU	*	
00165	47200203 P	242		STI	TGRAD,X2	SAVE UIO RETURN ADDRESS
00166	14200003	243		ENI	3,X2	COUNT OF FUNCTIONS
00167	21000204 P	244		LDQ	TBFUNC	LOAD FUNCTIONS TO ISSUE
	00170 P	245	TGNXT	EQU	*	
00170	13000006	246		SHAQ	6	
00171	42000753 P	00172 3	247	SACH	*+7	STORE NEXT FUNCTION
00172	77100000	248		SEL	IMPURE,SELECT	
00173	02600170 P	249		IJD	TGNXT,X2	
00174	02600170 P	250		IJD	TGNXT,X2	ISSUE ALL FOUR
00175	47000001 P	251		STI	STATAB,0	CLEAR STATUS
00176	14477777	252		ENA,S	777778	
00177	4200024 P	0.0005 0	253	SACH	TPI	SAY NOTHING DCING
00200	14200202 P	.	255	ENI	*+2,X2	ENTER RETURN ADDRESS
00201	01000077 X	.	256	UJP	UNCON	RELEASE CHANNEL
00202	54200145 P	.	257	LOI	RETURN,X2	LOAD THE RETURN ADDRESS
00203	01000000	.	258	TGRAD	UJP	ERROR RETURN
00204	21232505	.	259	TBFUNC	OCT	FUNCTION CODES FOR
		260		*		RELEASE READY AND NOT BUSY INT.
		261		*		RELEASE END OF OPERATION INT.
		262		*		RELEASE ABNORMAL END INTERRUPT
		263		*		SELECT CLEAR

264+002 \*\*  
 264+003 \*\* THIS ROUTINE WILL PROCESS CHANNEL INTERRUPTS ON THE DRIVE  
 264+004 \*\*

00205	00205 P	267	MPCHK	EQU	*	
00206	17600010	268	ANA	103	CHECK FOR MEMORY PARITY ERROR	
00207	03000212 P	269	AZJ, EQ	GIVINT	JUMP IF NOT MEMORY PARITY	
00210	20000001 P	270	LDA	STATAB		
00211	17601000	271	ANA	WRITBIT	CHECK FOR WRITE	
	03177777 X	272	AZJ, NE	TXMP	BAD NEWS	
00212	00212 P	273	GIVINT	EQU	*	
00213	77550000	274	CIA		CHANNEL NUMBER TO A	
00214	42001063 P 00214 3	275	SACH	*+7		
00215	53020000	276	TMA	IMPURE	GET BEGIN ADDRESS	
00216	15400003	277	INA, S	3		
00217	12077775	278	SHA	-2	MAKE WORD ADDRESS	
00218	17677777	279	ANA	777778		
00220	31000004 P	280	SBA	TPBGN	SUBTRACT STARTING ADDRESS	
00221	40000006 P	281	STA	TPRLNG	SAVE RECORD LENGTH	
00222	77100020	281+001	SEL	208, SENSE	SELECT READY NOT BUSY	
00223	01000234 P	281+002	UJP	CHTRUB	BAD NEWS	
00224	01000505 P	281+003	UJP	TPTIMUP1	GO SET TIME LIMIT	
00225	01000000	284	CHANINT	UJP	CALLED ON CHANNEL INTERRUPT	
00226	44000404 P	285	SWA	PARFLAG	SET ERROR INDICATORS	
00227	54200225 P	286	LDI	CHANINT, X2	LOAD THE RETURN ADDRESS	
00230	47200145 P	287	STI	RETURN, X2		
00231	03000212 P	288	AZJ, EQ	GIVINT	JUMP OFF IF NO ERRORS	
00232	05600400	289	ASG	400B	SKIP IF CHANNEL OVERTIME	
00233	01000205 P	290	UJP	MPCHK	GO SELECT INTERRUPT AND SCRAM	
00234	14477777	291	CHTRUB	ENA, S	777778	
00235	42000024 P 00005 0	292	SACH	TPI	SAY NOTHING OCING	
00236	47177777 X	292+001	STI	IOCL, X1	SAVE CHANNEL NUMBER FOR USE LATER	
00237	14677777 X	292+002	ENA	IOCLBIT	BIT TO SET	
00240	35077777 X	292+003	SSA	FLAGS	SET INTO SCHEDULR FLAGS WORD	
00241	40000240 X	292+004	STA	FLAGS	AND RESTORE IT	
00242	01000164 X	293	UJP	TXNR	GIVE NOT READY RETURN	

297	*****
298	**
299	*
299+001	ROUTINE TO RELEASE INTERRUPTS AND SET STATUS FOR MOTION
302	**
303	**
304	*****

00243	01000000	307	TPSLN	UJP	IMPURE	
00244	14600021	308	ISSUE	(218)	RELEASE READY AND NOT BUSY INT.	
00246	14600023	309	ISSUE	(238)	RELEASE EOP INTERRUPT	
00250	54100002 P	310	LDI	BINDEN, X1		
00251	22400040 P 00010 0	311	LACH	DENTAB, X1	LOAD FUNCTION CODE FOR DENSITY	
00252	00700130 P	312	RTJ	SEL		
00253	20000001 P	312+001	LDA	STATAB	GET DYNAMIC STATUS	
00254	12077774	312+002	SHA	-3	RRBIT TO BIT00	
00255	17600001	312+003	ANA	1	MASK TO 1 BIT	
00256	15600040	312+004	INA	40B	MAKE INTO A 40B OR 41B	
00257	00700130 P	318	RTJ	SEL		
00260	21000001 P	319	LDQ	STATAB		
00261	17720000	320	ANQ	SBINBIT	CHECK FOR BINARY	
00262	14400002	321	ENA, S	2	BCD	
00263	04500000	322	QSE, S	0		
00264	14400001	323	ENA, S	1	BINARY	
00265	00700130 P	324	RTJ	SEL		
00266	01000243 P	325	TPSLN		DONE	

329 \*  
 330 \*  
 331 \*  
 332 \*  
 333 \*  
 334 \*  
 335 \*  
 336 \*  
 337 \*  
 338 \*  
 SECTION TO PERFORM ERROR RECOVERY OPERATIONS.  
 ALCNT SPECIFIES HOW MANY RETRIES ARE TO BE MADE ON READ OPS.  
 IF A PARITY ERROR OCCURS ON A WRITE OPERATION, ONE TRY IS  
 MADE WITHOUT WRITING BLANK TAPE.

00267	77200001 P	341	ERREC	EQU	*		
00270	01000272 P	342	EXS	1,SENSE		CHECK FOR READY	
00271	01000164 P	343	UJP	*+2			
00272	77200000	344	UJP	UNERR		NOT READY	
00273	44000426 P	344+001	COPY	SENSE		GET LAST STATUS OF THE TAPE	
00274	00700243 P	344+002	SWA	MTSTATUS		SAVE IN CASE IT IS NEEDED	
00275	14600001	345	RTJ	TPSLN			
00276	34000416 P	345+001	ENA	1		UPDATE ERROR COUNTER	
00277	10000003 P	345+002	RAD	ERRCNT		FOR DISPLAY PURPOSES	
00300	01000304 P	345+003	SSH	ERK		CHECK TO SEE IF TIME TO QUIT	
00301	20077777 X	345+004	UJP	NIRIN		NOPE -- CONTINUE WITH OPERATION	
00302	34000006 P	350	LDA	BIT17		LOAD IRRECOVERABLE ERROR BIT	
00303	01000406 P	351	RAD	TPLRNG		SET INTO WORD RETURNED TO UIO	
	00304 P	352	UJP	TPRELS		OTHERWISE, SAME RETURN	
00304	20000001 P	353	NIRIN	EQU	*		
00305	17601400	354	LDA	STATAB		GET STATUS FOR THIS UNIT	
00306	12000002	355	ANA	READBIT+WRITBIT			
00307	35000001 P	356	SHA	2		GENERATE EREAD, EWRIT BITS	
00310	40000001 P	357	SSA	STATAB		SET INTO STATUS	
00311	12000017	358	STA	STATAB			
00312	03300320 P	358+001	SHA	23-8		CHECK READ BIT	
00313	12000027	358+002	AZJ,LT	ERead		THEN DO READ RECOVERY	
00314	03200445 P	358+003	SHA	24-8-9		CHECK WRITE BIT	
00315	14600012	358+004	AZJ,GE	TSTATUS		OK IF NOT READ OR WRITE	
00317	01000074 P	364	ISSUE	(12B)		SELECT BACKSPACE	
	00320 P	364+001	UJP	T-PNFR2			
00320	20000001 P	366	ERead	EQU	*		
00321	16620010	367	LOA	STATAB		GET STATUS FOR THIS UNIT	
00322	40000001 P	368	XOA	SBINBIT+RRBIT		REVERSE PARITY AND DIRECTION	
00323	00700243 P	369	STA	STATAB			
00324	20000001 P	370	RTJ	TPSLN		SELECT OPPOSITE PARITY	
00325	16620010	371	LDA	STATAB		LOAD STATUS BACK	
00326	40000001 P	372	XOA	SBINBIT+RRBIT		REVERSE PARITY AND DIRECTION	
00327	14400000	373	STA	STATAB		SET BACK CORRECTLY	
00330	74000010 P	374	ENA,S	0			
00331	00400007 P	375	INPW,INT	IO,CHBUF,CHBUF+1		CHECK FOR WRONG PARITY	
00332	01000330 P	376	UJP	*-2			
00333	01000145 P	377	UJP	RETURN		REJECT	
	00334 P	378	TREGO	EQU	*	RETURN	
00334	20000001 P	379	LDA	STATAB			
00335	17471777	380	ANA,S	-EREADBIT-EWRITBIT		LOAD STATUS FOR THIS UNIT	
00336	40000001 P	381	STA	STATAB		REMOVE ERROR INDICATORS	
00337	17600400	382	ANA	READBIT			
00340	03100354 P	383	AZJ,NE	TRRD		CHECK FOR READ OR WRITE	
00341	00700243 P	384	RTJ	TPSLN		JUMP IF READ	
00342	20000003 P	385	LDA	ERK		GO SELECT INTERRUPTS	
00343	05600003	385+001	ASG	ALCNT*2+1		CHECK FOR TIME TO WRITE BLANK TAP	
00344	01000056 P	385+002	UJP	TWRITE		SKIP IF TIME TO SKIP BAD SPOT	
00345	14600001	388	ENA	ALCNT		OTHERWISE JUST DO AGAIN	
00346	40000003 P	389	STA	ERK		ENTER ALLOWED COUNT	
00347	14600016	390	ISSUE	(16B)		RESET COUNTER	
00351	14604000	391	ENA	EWRITBIT		SKIP BAD SPOT	
00352	34000001 P	392	RAD	STATAB		ERROR ON WRITE	
00353	01000074 P	392+001	UJP	TPNFR2		SET INTO STATUS	
	00354 P	394	TRRD	EQU	*		
00354	14620000	395	ENA	SBINBIT			
00355	77202000	396	EXS	20000,SENSE		ENTER BINARY INDICATOR	
00356	14400000	397	ENA,S	0		CHECK FOR PARITY ERROR	
00357	36000001 P	398	SCA	STATAB			
00360	40000001 P	399	STA	STATAB		CHANGE MODE IF CKAY	
00361	00700243 P	400	RTJ	TPSLN			
00362	01000053 P	401	UJP	TREAD		GO SELECT MODES AND INTERRUPTS	

405 \*\*\*\*  
 406 \*\*  
 407 \*\*  
 408 \*\* ROUTINE FOR PROCESSING TAPE UNIT INTERRUPTS.  
 409 \*\*  
 410 \*\*  
 411 \*\*\*

00363	77730000 P	411+002	TPINT	EQU	*	
00364	47300145 P	411+003	VFD	A12/DINT	ALLOW NO INTERFERENCE	
	00365 P	411+004	STI	RETURN,X3	SAVE RETURN ADDRESS	
00365	00700146 P	415	RTJ	TPCON	CONNECT TO INTERRUPTING UNIT	
00366	20000474 P	415+001	LDA	TPTIMRT	GET INTERRUPT TO KILL	
00367	04000000	415+002	TPINT1	ISE	IMPURE,X0	SKIP IF NOT A TIMED INTERRUPT
00370	00777777 X	415+003	RTJ	TIMEKILL	KILL THE INTERRUPT IF HERE	
00371	47000367 P	415+004	STI	TPINT1,X0	CLEAR TIMED INTERRUPT FLAG	
	00372 P	415+005	TPINT2	EQU	*	
00372	47300043 P	415+006	STI	TWWD1,X3	ALLOW MORE OPERATIONS	
00373	04000000	415+007	TPDELY	ISE	IMPURE,0	SKIP IF NOT DELAYED
00374	01000046 P	415+008	UJP	TWWD	WE WAS DELAYED, Y#ALL	
00375	20000001 P	418	LDA	STATAB	LOAD STATUS	
00376	17606000	419	ANA	ERREADBIT+EWRITBIT		
00377	03100334 P	420	AZJ,NE	TREGO	JUMP FOR ERROR RECOVERY	
00400	77200010	421	EXS	10B,SENSE	CHECK FOR FILE MARK	
00401	01000445 P	422	UJP	TSTATUS	RETURN STATUS ONLY	
00402	77202400	423	EXS	2400B,SENSE	CHECK FOR ERRORS	
00403	01000267 P	424	UJP	ERREC	TRY FOR RECOVERY	
00404	04000000	425	PARFLAG	ISE	IMPURE,0	SKIP IF NO CHANNEL ERRORS
00405	01000267 P	426	UJP	ERREC	TRY FOR RECOVERY	

426+003 \*\*  
 426+004 \*\*  
 426+005 \*\* SECTION OF CODE TO RETURN STATUS TO USER PROGRAM \*

00406	20000001 P	429	TPRELS	EQU	*	TO RELEASE UNIT
00407	17600400	429+001	LDA	STATAB		GET UNIT STATUS OF THIS OPERATION
00410	14700066	429+002	ANA	READBIT		CHECK FOR READ
00411	04600000	429+003	ENQ	H#W#		THEN ASSUME A WRITE
00412	14700051	429+004	ASE	0		SKIP IF NOT A READ
00413	14200445 P	429+005	ENQ	H#R#		CODE FOR A READ
00414	00414 P	429+006	ENI	TSTATUS,X2		
00414	43000054 P	429+007	TPRELS1	EQU	*	
00415	12077767	429+008	SQCH	MTFUN		SAVE LAST TAPE OPERATION CODE
00416	14700000	429+009	SHA	-8		A=0 IF WRITE; A=1 IF READ
00417	03600445 P	429+010	ERRCNT	ENQ	IMPURE	NUMBER OF ERRORS ON THIS FUNCTION
00420	14600000	429+011	AQJ, GE	TSTATUS		JUMP IF NO APPARENT ERRORS
00421	51077777 X	429+012	ENA	0		FOR DIVIDE
00422	42000044 P	429+013	DVA	D10		CHANGE INTO 2 DECIMAL DIGITS
00423	43000045 P	429+014	SACH	MTERR		SAVE FIRST DIGIT
00424	22000027 P	429+015	SQCH	MTERR+1		AND SECOND DIGIT
00425	42000052 P	429+016	LACH	TPI+3		GET UNIT NUMBER FOR MESSAGE
00426	42000052 P	429+017	SACH	MTUNIT		AND PLACE INTO THE MESSAGE
00426	14700000	429+018	MTSTATUS	ENQ	IMPURE	LAST STATUS TO Q
00427	12400014	429+019	SHQ	12		TO UPPER 12 BITS
00430	14300432 P	429+020	ENI	*+2, X3		RETURN ADDRESS
00431	01077777 X	429+021	UJP	OCTPACK		CONVERT INTO BCD IN A
00432	40000014 P	429+022	STA	MTSTATP		PLACE INTO MESSAGE
00433	54100005 P	429+023	LDI	TPI, X1		GET TAPE UNIT INDEX
00434	20177777 X	429+024	LOA	TNUMLIST, X1		GET TAPE NUMBER ON THE DRIVE
00435	14100006	429+025	ENI	6, X1		OUTPUT 7 DIGITS
00436	13077747	429+026	SHAQ	-24		DOWN FOR DIVIDE
00437	51000421 X	429+027	DVA	D10		EXTRACT A DIGIT
00440	43400070 P	429+028	SQCH	TNUMP, X1		OUTPUT THE DIGIT
00441	02500436 P	429+029	IJD	*-3, X1		AND LOOP TO OUTPUT THE REST
00442	11000044 P	429+030	ECHA	MTERR		MESSAGE ADDRESS
00443	14700034	429+031	ENQ	MTERRL		LENGTH OF MESSAGE
00444	01077777 X	429+032	UJP	OPMSGX		INFORM XE'S OF PROBLEM
00445	00445 P	429+033			*	
00445	47000416 P	429+034	TSTATUS	EQU	*	
00446	20000001 P	429+035	STI	ERRCNT, 0		CLEAR ERROR COUNTER BEFORE EXIT
00447	17620000	432	LDA	STATAB		LEAVE BINARY INDICATOR
00450	04600000	433	ANA	SBINBIT		
00451	20077777 X	434	ASE	0		
00452	77200040	435	LDA	BIT18		BIT 18 SEZ BINARY RECORD PROCESSE
00453	35077777 X	436	EXS	403, SENSE		CHECK FOR END OF TAPE
00454	77200004	437	SSA	E0DB		SET END OF DATA IF SO
00455	01000457 P	438	EXS	4, SENSE		CHECK FOR WRITE ENABLE
00456	35077777 X	439	UJP	*+2		
00457	77200020	440	SSA	BIT23		SET FP BIT
00460	35077777 X	441	EXS	208, SENSE		CHECK FOR LOAD POINT
00461	77200010	442	SSA	1PB		SET LOAD POINT STATUS
00462	35077777 X	443	EXS	108, SENSE		CHECK FOR FILE MARK STATUS
00463	35000006 P	444	SSA	FMRBIT		SET BIT IN IF SO
00464	40000006 P	445	SSA	TPRLNG		SET STATUS INTO WORD COUNT
00465	47000001 P	446	STA	TPRLNG		
00466	14600001	447	STI	STATAB, 0		KILL STATUS
00467	40000003 P	448	ENA	ALCNT		ENTER ALLOWED PARITY ERRORS
00468	449+001	449	STA	ERK		FIX UP COUNTER
00470	14200472 P	449+002	ENI	*+2, X2		RETURN ADDRESS FROM SUBROUTINE
00471	01000165 P	449+003	UJP	TGRID		CLEAR CONTROLLER AND DRIVE
00472	20000006 P	450	LDA	TPRLNG		GET RECORD LENGTH AND STATUS
00473	01077777 X	461	UJP	TXNE		NORMAL END RETURN

461+004 \*\*  
 461+005 \*\* TPTIMEUP IS CALLED WHEN A TAPE OPERATION THAT DOES NOT TIE  
 461+006 \*\* THE CHANNEL UP HAS BEEN ACTIVE FOR ONE MINUTE  
 461+007 \*\* THIS ALLOWS FOR CHECKING AND RECOVERY WHEN SOMEONE  
 461+008 \*\* RUNS OFF THE END OF THE TAPE  
 461+009 \*\*

00474 02000476	461+011			
00475 01357750	461+012	TPTIMRT	VFD	06/02,03/0,A15/TPTIMEUP
	461+013	TPTIME	DEC	385000
	461+014			TIME FOR FULL MOVEMENT ON 2400 TA
00476 00476 P	461+015	TPTIMEUP	EQU	*
00476 47300145 P	461+016	STI	RETURN,X3	SAVE THE RETURN ADDRESS
00477 47000367 P	461+017	STI	TPINT1,X0	SAY NO TIME INTERRUPT
00500 14700021	461+018	ENQ	H#A#	SAY ABNORMAL CONDITION
00501 14600001	461+019	ENA	1	SAY ONE ERROR
00502 44000416 P	461+020	SWA	ERRCNT	
00503 14200365 P	461+021	ENI	TPINT0,X2	PLACE TO RETURN TO.
00504 01000414 P	461+022	UJP	TPRELS1	GO WRITE MESSAGE FIRST
	461+023			
	461+024			
00505 00505 P	461+025	TPTIMUP1	EQU	*
00505 20000475 P	461+026	LDA	TPTIME	GET THE TIME LIMIT
00506 21000474 P	461+027	LOQ	TPTIMRT	
00507 00777777 X	461+028	RTJ	TIMSET	
00510 47200367 P	461+029	STI	TPINT1,X2	AND SAY IT IS A TIMED INTERRUPT
00511 01200000	461+030	UJP	0,X2	RETURN TO CALLER
	464		END	

NO LINES WITH ERRORS

ALCNT	00001	34+1	61 00003P	385+1 00343P	388 00345P	448 00466P		
BINDEN	00002P	60	94 00022P	310 00250P				
BIT17	X	20	350 00301P					
BIT18	X	21	435 00451P					
BIT20	X	22	38 00000P					
BIT21	X	23	37 00000P					
BIT22	X	24	41 00000P					
BIT23	X	25	440 00456P					
CHANINT	00225P	284	230 00155P	286 00227P				
CHBUF	00007P	66	375 00330P	375 00330P				
CHTRUB	00234P	291	281+2 00223P					
CLOCK	00022	36	114 00046P	175 00124P	182 00133P			
CONNECT	X	26	229 00154P					
D10	X	25+1	429+13 00421P	429+27 00437P				
DENTAB	00010P	67	311 00251P					
DINT	07773	39+2	411+3 00363P					
EINT	07774	39+1						
EOD3	X	37	437 00453P					
EREAD	00320P	366	358+2 00312P					
EREADBIT	02000	57	380 00335P	419 00376P				
ERK	00003P	61	345+3 00277P	385 00342P	389 00346P	449 00467P		
ERRCNT	00416P	429+10	345+2 00276P	429+35 00445P	461+20 00502P			
ERREC	00267P	341	424 00403P	426 00405P				
EWRTBIT	04000	58	380 00335P	391 00351P	419 00376P			
FINISH	00120P	164	152 00105P					
FLAGS	X	25+4	292+3 00240P	292+4 00241P				
FMRBIT	X	38	444 00462P					
FUNCTION	00052P	118	93 00021P					
GIVINT	00212P	273	269 00206P	288 00231P				
IMPURE	00000	39	48 00001P	60 00002P	61 00003P	62 00004P	64 00005P	65 00006P
			66 00007P	110+1 00043P	118 00052P	177 00126P	179 00130P	206 00141P
			207 00142P	208 00143P	210 00145P	223 00146P	225 00150P	248 00172P
			258 00203P	276 00214P	284 00225P	307 00243P	415+2 00367P	415+7 00373P
IO	00000	40	207 00142P	375 00330P				
IOCL	X	25+2	292+1 00236P					
IOCLBIT	X	25+3	292+2 00237P					
ISUF	00126P	177	180 00131P	183 00134P				
LPB	X	41	442 00460P					
MPCHK	00205P	267	290 00233P					
MTCN	00150P	225	7 00000P					
MTERR	00011P	67+1	67+2 00020P	67+3 00020P	67+4 00020P	67+5 00020P	67+6 00020P	429+14 00422P
			429+15 00423P	429+30 00442P				
MTERRL	00034	67+6	429+31 00443P					
MTFUN	00013P	67+3	429+8 00414P					
MTSTATP	00014P	67+4	429+22 00432P					
MTSTATUS	00426P	429+18	344+2 00273P					
MTUNIT	00012P	67+2	429+17 00425P					
NEWCLK	00133P	182	176 00125P					
NIRIN	00304P	353	345+4 00300P					
OCTPACK	X	26+1	429+21 00431P					
OPMSGX	X	31+1	429+32 00444P					
PARFLAG	00404P	425	285 00226P					
PFPA	00141P	206	102 00032P					
READBIT	00400	55	125 00054P	355 00305P	382 00337P	429+2 00407P		
REJ	00124P	175	178 00127P					
RETURN	00145P	210	92 00020P	143 00076P	226 00151P	232 00157P	257 00202P	287 00230P
			377 00333P	411+4 00364P	461+16 00476P			
RRBIT	00010	54	368 00321P	372 00325P				
SBINBIT	20000	59	96 00024P	320 00261P	368 00321P	372 00325P	395 00354P	433 00447P
SEL	00130P	179	140+1 00070P	15 00075P	5 00107P	5 00113P	165 00120P	5 00245P
			5 00247P	312 00252P	318 00257P	324 00265P	5 00316P	5 00350P
SELECT	00000	42	177 00126P	248 00172P				
SENSE	00000	43	111 00044P	130 00060P	136 00064P	149 00102P	161 00115P	235 00162P
			281+1 00222P	342 00267P	344+1 00272P	396 00355P	421 00400P	423 00402P
STATAB	00001P	48	97 00025P	436 00452P	438 00454P	441 00457P	443 00461P	
			319 00260P	354 00304P	357 00307P	358 00310P	367 00320P	369 00322P
			371 00324P	373 00326P	379 00334P	381 00336P	392 00352P	398 00357P
			399 00360P	418 00375P	429+1 00406P	432 00446P	447 00465P	
TBFUNC	00204P	259	244 00167P					
TBKSP	00115P	160	9 00000P					
TFWSP	00106P	153	10 00000P					
TGNXT	00170P	245	249 00173P	250 00174P				
TGRAD	00203P	258	242 00165P					
TGRID	00165P	241	134 00063P	234 00161P	449+2 00471P			
TIMEKILL	X	26+2	415+3 00370P					
TIMEIM	X	11610	44	227 00452P				
TIMSET	X	26+3	461+28 00507P					

